COLORADO RIVER RECOVERY PROGRAM
FY 2012 ANNUAL PROJECT REPORT

RECOVERY PROGRAM
PROJECT NUMBER: 166

I. Project Title: Water Quality Monitoring on the Yampa and Green Rivers

II. Bureau of Reclamation Agreement Number(s): R12PG40022

Project/Grant Period: Start date (Mo/Day/Yr): 10/01/2012
End date: (Mo/Day/Yr):11/30/13
Reporting period end date: October 2012
Is this the final report? Yes _X____ No _____

III. Principal Investigator(s):

Dusty Perkins, Ph.D.
Program Manager
National Park Service
Northern Colorado Plateau Network
Western State College
Environmental Studies Center
600 N. Adams St., 106 Kelley Hall
Gunnison, CO 81231
970-589-1474

Tamara Naumann
Dinosaur National Monument
970-374-3051

David Brown
USGS/Colorado Water Science Center
Denver Federal Center
Building 53 MS 415
PO Box 25046
Lakewood, CO 80225

IV. Abstract:

The Green and Yampa Rivers in Dinosaur National Monument support important endangered fish habitat but have known and emerging water quality risks to fish health. This project funded two of 8 water quality visits completed at Deerlodge Park on the Yampa River and at Gates of Lodore on the Green River to sample for field measures, nutrients, major ions, trace elements, total dissolved solids, and fecal indicator bacteria (*Escherichia coli*). All proposed activity for this project was completed in Fiscal Year 2012. The Yampa River exceeded the iron standard and the interim phosphorus value for aquatic warm water biota on 3/27/12. The Green River exceeded the water temperature standard for aquatic cold water biota on 6/20/12 and 8/27/12. This sampling augmented

ongoing quarterly core parameter monitoring and monthly Contaminant of Emerging Concern sampling on the Yampa River funded through other sources.

V. Study Schedule: Fiscal Year 2012

VI. Relationship to RIPRAP:
General Action Plan:
II. Restore Habitat (Habitat Development and Maintenance)
Green River Action Plan: Mainstem
II.B. Support actions to reduce or eliminate contaminant impacts. [NOTE: Contaminants remediation (in all reaches) will be conducted independently of and funded outside of the Recovery Program]
Yampa River Action Plan:
II.A.3. Review NPS/USGS report to assess potential for negative impacts of elevated pH to endangered fish [complete].

VII. Accomplishment of FY 2012 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

All tasks were completed on time and within budget.

Task 1a. Paired water-quality field measurements and samples were collected at USGS 09260050, Yampa River at Deerlodge (DINO) four times during FY 2012 in coordination with the NCPN. Samples were taken in October, March, June, and September.

Deliverables. Final data were archived in the USGS NWIS database in November 2012. NCPN will be completing a final report in FY 2013 covering water quality data at all NCPN parks (including these data) since 2009.

Findings. Iron exceeded the chronic aquatic life warm water 1 standard of 1000 µg/L with a reading of 3440 µg/L on 3/27/12. Phosphorus exceeded the interim aquatic life warm water annual median value of 170 µg/L with a reading of 242 µg/L on 3/27/12. Measurements of 18 other parameters with standards showed no exceedances during FY2012. 37 parameters total were measured.

Task 1b. Paired water-quality field measurements and samples were collected at USGS 404417108524900, Green River above Gates of Lodore (DINO) four times during FY2012 in coordination with the NCPN. Samples were taken in October, March, June, and September.

Deliverables. Final data were archived in the USGS NWIS database in November 2012. NCPN will be completing a final report in FY 2013 covering water quality data at all NCPN parks (including these data) since 2009.

Findings. Water temperature exceeded the chronic Class 1 Tier 1 cold water biota criterion of 17.0 °C with values of 18.0 °C and 19.0 °C on 6/20/12 and 8/27/12 respectively. Measurements of 19 other parameters with standards showed no exceedances during FY2012. 37 parameters total were measured.

VIII. Recommendations:

Long-term monitoring of water quality in the Green and Yampa Rivers near Dinosaur National Monument continues to be a high priority. Continued iron exceedances, increasing trends in nitrogen, and recent sampling for Contaminants of Emerging Concern, including endocrine disrupting chemicals, highlight current risks to aquatic habitat. Proposed diversions continue to threaten the systems. We recommend continued quarterly sampling of water quality parameters to detect new and continuing trends that pose a risk to fish habitat and health.

IX. Project Status:

This project was funded by BOR for FY2012 only. However, a consortium of interests is committed to maintaining water quality sampling on the Green and Yampa Rivers, and the water quality monitoring effort is on-going.

X. FY 2012 Budget Status

A. Funds Provided: $5000
B. Funds Expended: $5000
C. Difference: N/A
D. Percent of the FY 2012 work completed, and projected costs to complete: 100% completed
E. Recovery Program funds spent for publication charges: $0

XI. Status of Data Submission (Where applicable):

Data have been finalized and archived in the USGS NWIS database, where they are available for public download and use.

XII. Signed: Dustin Perkins 11/8/12

Principal Investigator Date

APPENDIX: Raw data for FY2012 water quality samples at Yampa River at Deerlodge Park and Green River above Gates of Lodore.

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY PROCESS DATE 11-06-12
MULTIPLE STATION ANALYSES

Station number	Station name	Date	Time	Barometric pressure, mm Hg	Instantaneous discharge, ft3/s	Dissolved oxygen, mg/L	Dissolved oxygen, percent of saturation
09260050	YAMPA RIVER AT DEERLODGE PARK, CO	10-18-11	1300	629	802	11.3	124
	YAMPA RIVER AT DEERLODGE PARK, CO	03-27-12	1000	623	2160	9.8	98
	YAMPA RIVER AT DEERLODGE PARK, CO	06-25-12	1300	620	182	6.7	100
	YAMPA RIVER AT DEERLODGE PARK, CO	09-24-12	1130	622	86	8.0	103
404417108524900	GREEN RIVER ABOVE GATES OF LODORE, CO	10-28-11	1345	632	2340	11.1	112
	GREEN RIVER ABOVE GATES OF LODORE, CO	03-26-12	1430	622	2920	10.8	108
	GREEN RIVER ABOVE GATES OF LODORE, CO	06-20-12	1515	628	1390	7.6	98
	GREEN RIVER ABOVE GATES OF LODORE, CO	08-27-12	1500	631	1550	8.0	104

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY PROCESS DATE 11-06-12
MULTIPLE STATION ANALYSES

Station number	pH, water, unfltrd field, std units	Specific conductance, wat unf uS/cm @ 25 degC	Temperature, water, deg C	Dissolved solids, sum of constituents, mg/L	Dissolved solids, water, tons/ acre-ft	Dissolved solids, water, ton/d	Calcium water, fltrd, mg/L	Magnesium, water, fltrd, mg/L	Potassium, water, fltrd, mg/L	Sodium, water, fltrd, mg/L	Alkalinity, wat flt inf tit field, mg/L as CaCO3	Bicarbonate, wat flt infl pt titr., field, mg/L
09260050	8.5	487	10.8	295	.40	640	41.1	20.1	2.27	33.9	135	160
	8.5	520	6.8	335	.46	1950	48.6	22.0	2.87	33.9	127	151
	8.4	486	25.1	270	.37	133	36.2	15.5	2.64	40.8	109	127
	8.5	655	17.6	--	--	--	--	--	--	--	134	156
404417108524900	8.7	609	7.6	385	.52	2430	60.8	21.6	2.76	45.1	156	182
	8.6	588	6.5	388	.53	3060	58.0	20.6	2.46	43.7	163	192
	8.4	575	18.0	360	.49	1350	55.5	20.4	2.34	44.0	153	182
	8.5	587	19.0	--	--	--	--	--	--	--	146	172

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY PROCESS DATE 11-06-12
MULTIPLE STATION ANALYSES

Station number	Carbonate, wat flt infl pt titr., field, mg/L	Chloride, water, fltrd, mg/L	Fluoride, water, fltrd, mg/L	Silica, water, fltrd, mg/L as SiO2	Sulfate water, fltrd, mg/L	Ammonia + org-N, water, unfltrd mg/L as N	Ammonia water, fltrd, mg/L as N	Nitrate + nitrite water, fltrd, mg/L as N	Nitrite water, fltrd, mg/L as N	Orthophosphate, water, fltrd, mg/L as P	Phosphorus, water, unfltrd mg/L as P	E coli, modif. m-TEC, water, col/ 100 mL
09260050	2.3	13.6	.23	5.40	97.9	.25	.012	<.01	<.001	<.004	.062	E17
	1.8	10.2	.23	12.7	127	.68	.012	.19	.003	.025	.242	33
	2.7	20.4	.21	1.62	87.7	.34	<.010	.02	<.001	<.004	.020	E8
	3.4	--	--	--	--	.41	<.010	<.01	<.001	<.004	.027	29
404417108524900	4.1	16.3	.26	2.91	142	.26	<.010	.01	<.001	<.004	.017	E2
	3.4	16.2	.29	2.93	146	.30	<.010	.01	<.001	<.004	.035	E5
	2.3	15.3	.21	.766	129	.27	.011	<.01	<.001	<.004	.036	E2
	3.1	--	--	--	--	.32	<.010	<.01	<.001	<.004	.041	130

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY PROCESS DATE 11-06-12
MULTIPLE STATION ANALYSES

Station number	Cadmium water, fltrd, ug/L	Copper, water, fltrd, ug/L	Iron, water, unfltrd recover -able, ug/L	Lead, water, fltrd, ug/L	Manganese, water, fltrd, ug/L	Manganese, water, unfltrd recover -able, ug/L	Silver, water, fltrd, ug/L	Zinc, water, fltrd, ug/L	Selenium, water, fltrd, ug/L
09260050	<.016	<.80	765	.028	4.20	30.5	<.005	<1.4	.47
	.016	.97	3440	.051	4.14	130	<.005	<1.4	1.0
	<.016	1.0	119	.029	6.10	26.4	<.005	<1.4	.37
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404417108524900	<.016	<.80	178	<.025	1.84	8.64	<.005	<1.4	.58
	<.016	<.80	370	<.025	5.16	18.1	.006	<1.4	.56
	<.016	<.80	230	<.025	1.72	12.2	<.005	1.4	.53
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0Remark codes used in this table:
< -- less than
E -- estimated